

Amtech Technology Can Share with Wide-Area AVM and Is Compatible with Other Uses

- Local-area AVM systems should be allowed to share spectrum with at least some of the wide-area AVM systems.
 - Amtech has tested its technologies with Pinpoint and has found that the two can co-exist on a co-primary basis.
- Amtech is willing to test with other technologies, including Part 15.

Modified NPRM Band Plan

Shared among wide-area
AVM systems without the
use of time-sharing.

Shared among wide-area
AVM systems on a
time-sharing basis.

Wide-
Area
AVM

Local-
Area
AVM

Wide-
Area
AVM

Local-
Area
AVM

902
MHz

904
MHz

912
MHz

918
MHz

926
MHz

928
MHz

Part 15 Devices

902
MHz

928
MHz



Shared among wide-area
AVM systems without the
use of time-sharing.



Shared among wide-area
AVM systems on a
time-sharing basis.



Local-area AVM



Part 15 Devices

Notes:

1. Wide-area forward links are to be located in the sub-band in which a licensee's wideband pulse is generated.
2. Local-area AVM and wide-area AVM would share at 918–926 MHz on a height-power differential basis pursuant to Section 90.173(b) of the Commission's Rules. Thus, the local-area systems would not time-share with wide-area AVM systems.

Modified NPRM Band Plan

General Principles:

- A compromise accommodation that attempts to meet minimum spectrum requirements.
- A band plan that can be adopted on the often conflicting record in Docket 93-61 so as to bring it to a swift conclusion.

Wide-Area AVM:

- Affords spectrum for a variety of competitive wide-area technologies in two 8 MHz sub-bands.
- No change in the amount of spectrum currently allocated.
- Provides 8 MHz of spectrum for wide-area technologies in which time-sharing would not be required and in which there would be no operation of local-area systems except as may be grandfathered.

- Provides 8 MHz of spectrum for wide-area systems that can time share with other wide-area systems, and that can share on a co-primary basis with local-area systems (on a height-power differential basis making use of near-far considerations).
 - 8 MHz sub-band also facilitates open entry for evolving technologies and for local government licensees.

Local-Area AVM:

- Affords sufficient spectrum to accommodate a variety of existing and proposed technologies used to serve millions of motor vehicles and over a million rail cars.
- Provides for at least two 6 MHz-wide channels to accommodate new high-speed technologies with some flexibility to shift center frequency if needed to ameliorate interference.

Amateur Radio:

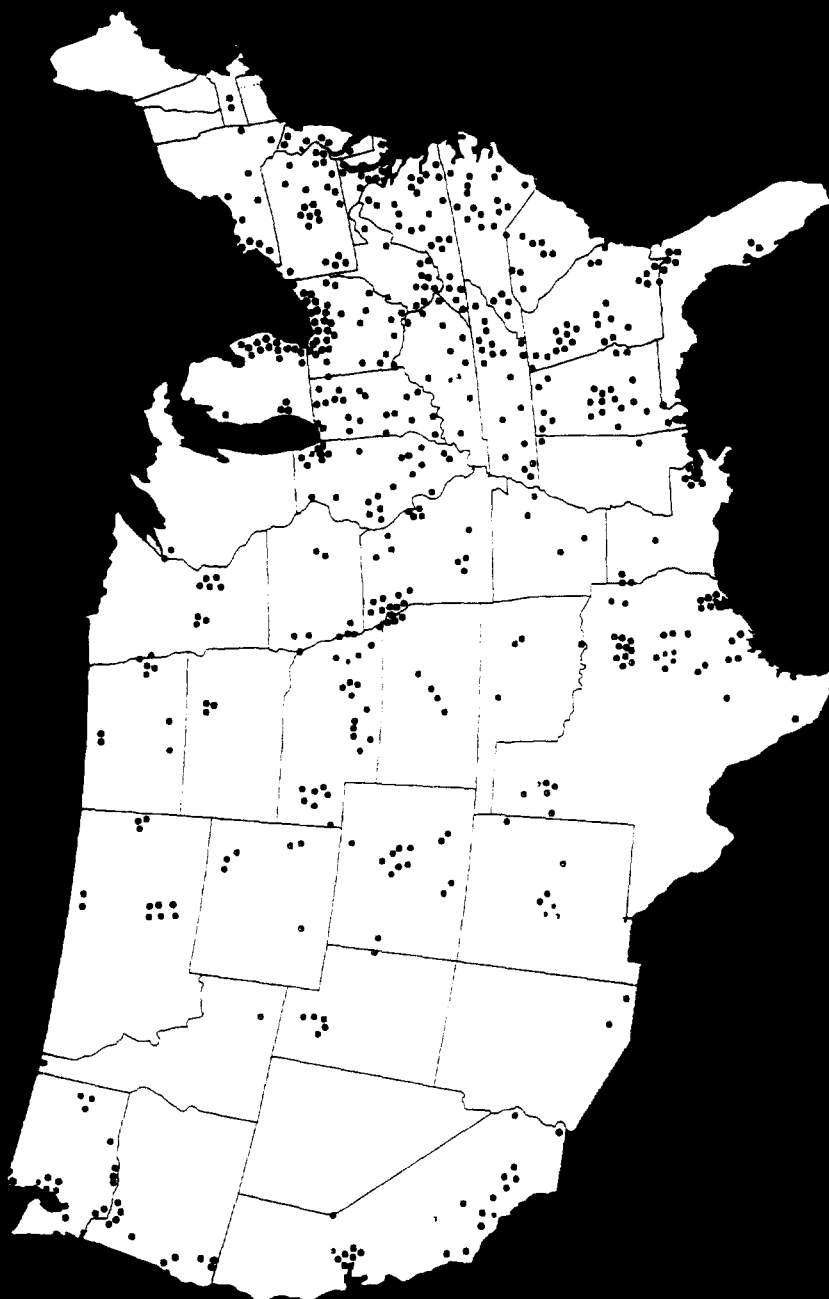
- No change in the current regulations.
- Amateurs would have increased certainty as to where various types of higher and lower priority systems might operate.

Part 15 Unlicensed Devices:

- No change in the current regulations, but Part 15 devices would have 10 MHz of "safe havens" outside wide-area AVM spectrum in which unlicensed system designers could reasonably predict lower noise levels and a higher degree of compatibility.
- Could also be coupled with a more quantitative definition of harmful interference, a rebuttable presumption of non-interference for certain devices, and/or a requirement to negotiate over the resolution of interference.

Grandfathering Under Modified NPRM Band Plan:

- FCC should accommodate substantial public investment in local-area AVM under the current rules.
- Local-area systems in 904-912 MHz should be grandfathered indefinitely if :
 - currently installed or
 - currently in design and application state and deployed within three years.
 - Interference situations would be resolved through mutual cooperation of wide-area AVM and grandfathered local-area systems pursuant to Section 90.173(b).
 - Where *actual* harmful interference cannot otherwise be resolved, grandfathered local-area systems must move frequencies at expense of wide-area system.



Source: Association of American Railroads
Intermodal Sites

AMTECH

United States Reader Distribution

(all markets, excluding rail)



Legend

- Electronic Toll and Traffic Management (ETTM)
- Airports
- Intermodal
- Motor Freight/Fleet Management
- Parking and Security/Access Control
- CAPUE ETTM Sites

Total Reader sites (excluding rail) 982
 Total Tagged Vehicles in U.S. Circulation 2,276,800

Amtech Corporation Selected Installation Matrix
Electronic Toll and Traffic Management Systems

Name/Location	Type of Facility	Length (km/miles)	Number of Lanes		Average Daily Transactions		Tags	Implementation Date	Remarks
			Total	AVI	Total	AVI			
GA									
GA-400, Atlanta, Georgia USA	Toll Road	10 km, 6 miles	18	18	69,000	15,500	35,000	08/93	Four lanes are designated AVI-only express lanes. Unique to this contract is the provision of a license plate-mounted tag.
LA									
Crescent City Connection, New Orleans, Louisiana USA	Bridge		12	12	70,000	21,000	34,000	01/89	Three lanes are dedicated tag-only lanes. During rush hour, 96% of tag users use the dedicated lanes. These tags may also be used on the Lake Pontchartrain Causeway.
Lake Pontchartrain Causeway, New Orleans, Louisiana USA	Bridge	42 km, 26 miles	6	6	27,500	15,600	15,600	12/90	Two lanes are dedicated AVI-only during peak-hour traffic. TollTag usage approaches 90% of total rush hour transactions.
NY									
Lincoln Tunnel, Port Authority of New York and New Jersey USA	Tunnel		12	2	2,000	2,000	3,100	04/88	This ETC collects tolls from buses. It is the longest continuously operating ETC system in the U.S.
New York State Thruway, New York USA	3 Toll Plazas, 2 Bridges		41	41	169,000	68,000	87,000	10/93	Spring Valley, Tappan Zee Bridge, Grand Island Bridge-Buffalo (each of these locations has two AVI-only lanes which will expand to four as demand increases); Harriman and Yonkers. Tags issued by the E-ZPass Center can be used at any of the locations.
OK									
Oklahoma Turnpike Authority, Oklahoma USA	10 Toll Roads	940 km, 585 miles	258	209	160,000	70,000	250,000	01/91	The world's largest AVI toll collection system. 88 lanes were implemented in 1/91, followed by another 97 lanes in 9/91 and 24 lanes in 3/92. Amtech opened and now operates PikePass retail offices in Tulsa and Oklahoma City.

Blanks indicate unknown, not applicable, or proprietary information.

Amtech Corporation Selected Installation Matrix
Electronic Toll and Traffic Management Systems

Name/Location	Type of Facility	Length (km/miles)	Number of Lanes		Average Daily Transactions		Tags	Implementation Date	Remarks
			Total	AVI	Total	AVI			

TX

Dallas North Tollway, Texas Turnpike Authority, Dallas, Texas USA	Toll Road	27 km, 17 miles	91	91	300,000	85,000	90,000	06/89	First toll road in the U.S. to incorporate ETTM. Twenty-eight lanes were recently added as part of a highway extension.
Harris County Toll Road Authority (HCTRA), Texas USA	2 Toll Roads	80 km, 50 miles	69	69	290,000	30,000	40,000	10/92	The HCTRA operates the Sam Houston Tollway and the Hardy Toll Road. This system also accepts tags issued by the Oklahoma Turnpike Authority and Texas Department of Transportation.
Texas Department of Transportation USA	8 Highways		476				4,200	11/93	Phase I monitors traffic conditions on three Houston freeways; Phase II covers five more highways. This is the first application of AVI for electronic traffic monitoring, and is used in conjunction with tags issued by other public and private entities.

Amtech Corporation Selected Installation Matrix

Airport Operations Applications

Name/Location	Type of Facility	Number of Readers or Lanes	Number of Tags	Implementation Date	Remarks
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CA

Burbank Airport, California USA	Airport (Congestion Pricing System)	4	1,000	06/92	Commercial vehicles are identified, counted and assessed appropriate fees each time they enter the airport. Major airport systems in California share the same installed tag base.
John Wayne Airport, Santa Anna, California USA	Airport (Congestion Pricing System)	5	500	10/91	The system monitors commercial ground transportation vehicles for fee collection and traffic management purposes. Major airport systems in California share the same installed tag base.
Los Angeles International Airport, Los Angeles, California USA	Airport (Congestion Pricing System)	41	5,500	09/90	The first congestion pricing system to provide accurate entry and exit records for user fee collection purposes as well as determining dwell times within an airport terminal area. Major airport systems in California share the same installed base.
Oakland Airport, Oakland, California USA	Airport (Congestion Pricing System)	4	600	07/92	The system provides billing information based on circulation and dwell times for commercial vehicles and schedule compliance for airport buses. Major airport systems in California share the same installed tag base.
Ontario International Airport, Los Angeles, California USA	Airport (Congestion Pricing System)	7	1,000	04/92	The system provides accurate entry and exit records for fee collection and traffic management purposes. Major airport systems in California share the same installed tag base.

MN

Minneapolis Airport, Minnesota USA	Airport (Commercial Vehicle Tracking)				
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NM

Albuquerque Airport, New Mexico USA	Airport (Commercial Vehicle Tracking System)	2	350	12/93	
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NY

John F. Kennedy International Airport, New York, New York USA	Airport (Bus System Schedule Compliance)	14	68	11/91	This AVI system monitors schedule compliance for two separate bus systems.
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Amtech Corporation Selected Installation Matrix
Airport Operations Applications

Name/Location	Type of Facility	Number of Readers or Lanes	Number of Tags	Implementation Date	Remarks
TX					
Dallas-Ft. Worth International Airport, Texas USA	Airport (Controlled Access)	51	2,200	12/92	This landside system validates usage authorization, controls barrier gates, and provides access control to selected areas of the airport.
UT					
Salt Lake City Airport, Utah USA	Airport (Usage and Compliance Routing)	17	1,000	03/93	Commercial vehicles are tagged for the purpose of billing for airport usage and compliance routing.
WA					
Seattle-Tacoma International Airport, Washington USA	Airport (Lane Monitoring)	7	250	10/91	This system monitors lanes at the entry point of the arriving passenger pick-up area.

Amtech Corporation Selected Installation Matrix

Intermodal Applications

Name/Location	Type of Facility	Number of Readers or Lanes	Number of Tags	Implementation Date	Remarks
U.S. Army USA	Military	19	2,680	01/91	Custom-designed mobile and fixed reader systems provided material tracking during the Desert Storm operation in Saudi Arabia.
CA					
American President Lines (APL) USA	Terminal		100,000	09/88	Nearly all aspects of terminal activities benefit from Amtech systems -- results have shown greater efficiency, fewer errors and better inventory management. Containers, chassis, tractors, railcars and other equipment will be tagged over a five-year period.
Mitsui OSK, Long Beach, California USA	Terminal	3	70		This test project involved creation of a "paperless" gate transaction system. Tags on dray tractors expedite processing of container movements.
Southern Pacific Transportation Company USA	Terminal	3	70	05/89	Amtech's AVI system is used to automatically receive and dispatch intermodal freight container movements to or from double-stack trains.
HA					
Matson Navigation Company USA	4 Terminals	40	30,000	06/93	Amtech automatic equipment identification systems enable Matson to use its equipment more efficiently by automatically identifying containers, over-the-road trucks, intermodal chassis, and generator sets.
NJ					
Maier Terminals USA	2 Terminals	4			The system identifies tractors arriving at the terminal, enabling efficient management and better allocation of terminal resources.
Sea-Land Services, Inc., Anchorage, Alaska USA	Terminal	4	4,000	12/89	Amtech automatic equipment identification system was extensively tested and evaluated with the installation of a gate system. Development projects for container location by a mobile inventory vehicle and gantry cranes followed.

Amtech Corporation Selected Installation Matrix
Motor Freight/Fleet Management Applications (U.S.)

Name/Location	Type of Facility	Number of Readers or Lanes	Number of Tags	Implementation Date	Remarks
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AZ

Magma Copper, Tucson, Arizona USA	Mine	1	20	09/91	This access control system tracks heavy equipment used in mine operations.
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CA

Food 4 Less, La Habra, California USA	Distribution Center	1	250		An Amtech AEI system is used to automatically record the passage of tagged tractor and trailers at an arrival/dispatch island.
The Vons Company, Los Angeles, California USA	6 Distribution Centers	14	1,800	09/93	Gate systems help automate dispatching functions and provide integrated tracking and inventory control capabilities. The average overall yard time per transaction pair went from 59 minutes to 42 minutes, a savings of more than 50,000 hours per year.

KY

University of Kentucky, Bowling Green, Kentucky USA	AEI/WIM Mainline Pre-Clearance	1	110	08/91	Part of a study to demonstrate pre-clearance systems, this system allows trucks traveling at highway speeds to roll over weigh-in-motion (WIM) scales, and coincident with identification via AEI, to be cleared for passage at the port of entry.
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MI

Thompson McCally, Michigan USA	Gravel Yard	4	200	03/91	This trucking company uses Amtech AVI systems to manage its fleet of trucks that haul gravel.
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MO

Contract Freighters, Inc. (CFI), Joplin, Missouri USA	Fleet Yard	2	1,600	01/94	Entrance and exit lanes are monitored to provide convenient and secure access control, allowing automatic "check calls" as tractors arrive and depart.
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Amtech Corporation Selected Installation Matrix
Motor Freight/Fleet Management Applications (U.S.)

Name/Location	Type of Facility	Number of Readers or Lanes	Number of Tags	Implementation Date	Remarks
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NM

State of New Mexico, Gallup and San Jon Ports of Entry USA	2 Ports of Entry	8	8,000	12/89	Integrated with weigh-in motion capabilities, the new system performs weight and credential checks while vehicles are in motion, allowing vehicles to pass through this port at up to 30 mph.
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NY

Consolidated Edison, New York, New York USA	Fleet Yard & Parking Garage	6	400	10/91	Amtech systems are installed at two equipment yards to record the passage of tagged trucks and other equipment at the gate locations, and at a parking garage to provide access control. A follow-on system provides employee accountability and security enhancements.
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TX

Star Enterprise (Texaco), Texas USA	4 Bulk Fueling Terminals	9	1,300	03/90	Amtech's AEI equipment is used to identify trucks and trailers parked in fuel loading bays. Before loading is permitted, the system checks a unit inspection record to verify that the unit has been certified vapor-tight.
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VT

C&S Wholesale Grocers, Inc., Brattleboro, Vermont USA	4 Warehouses	4	1,300	08/93	Amtech's AVI system tracks and records equipment movements among warehouse facilities. C&S uses the system to accurately track vehicle movements, maintain a real-time inventory of equipment by location, and measure equipment utilization.
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WV

Peabody Coal, West Virginia and Kentucky USA	Coal Yard	5	800	09/90	Amtech systems are used for automating truck scale operations of coal trucks. This system speeds scale operations for the truck drivers, providing time to haul extra loads. Since the driver remains in the truck, another benefit is driver safety from hazards.
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Amtech Corporation Selected Installation Matrix
Parking and Security/Access Control Applications

Name/Location	Type of Facility	Number of Readers or Lanes	Number of Tags	Implementation Date	Remarks
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AL

Overton Estates, Birmingham, Alabama USA	Residential Community	2	300	05/93	Access control system for three lanes at a residential community.
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CA

The Vintage Club, Indian Wells, California USA	Residential Community	3	3,000	10/90	This security system is a leading example of high-end residential access control systems.
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TX

Rancho Mirage/Rancho Palisades, Texas USA	2 Apartment Complexes	4	500		Access control systems for apartment complexes. Residents who have Dallas North Tollway TollTags can use them to gain access to their apartment complex.
The Cliffs of Gleneagle, Plano, Texas USA	Residential Community	2	250	03/94	A residential community with an Amtech access control system. Residents who have Dallas North Tollway TollTags can also use them to gain access to their community.
The Enclave at Willow Bend, Plano, Texas USA	Residential Community	2	50	07/92	Residential gate access control system.

Amtech Corporation Selected Installation Matrix
Light Rail/Bus Transit

Name/Location	Type of Facility	Number of Readers or Lanes	Number of Tags	Implementation Date	Remarks
NJ					
Newark International Airport, New Jersey USA	People Mover	27	200		Readers are installed on the people mover trains; tags installed along the routes provide location information. The objective is to provide operators with more timely and accurate information as a basis for scheduling, dispatching and controlling transit fleets.

Note: North America's railroads have virtually completed placing two tags on each of some 1.4 million rail cars. Ultimately, there will be 3,000 to 5,000 tag readers associated with this system.